



The Mark of the Professional...

USER'S MANUAL



D-250AL POWER AMPLIFIER

Product Description	2	Using Horn Speakers	5
Specifications	2	The Auto-Mute Circuit	6
Unpacking Procedures	3	Maintenance	6
Product Overview	3	Warranty & Service	6
Installation Information	3	Schematic	7
The Front Panel	4	Troubleshooting	8
The Back Panel	4	Accessories	8
Speaker Installation	5		

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NEW TECHNOLOGY



OLD RELIABILITY

J.W. Davis & Company • 3030 Canton Street • P.O. Box 710219 • Dallas, Texas 75371-0219
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WARNINGS



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, **DO NOT** EXPOSE THIS UNIT TO RAIN OR MOISTURE



WARNING: THIS AMPLIFIER MUST BE GROUNDED. **DO NOT** REMOVE GROUND PIN FROM AC PLUG OR USE A DEVICE TO CHANGE FROM A 3-PIN AC PLUG.



CAUTION: In the event the transformer's thermal breaker does not reset, have the trouble investigated by an authorized service technician or return unit to the factory.



CAUTION: These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

The **D-250AL** is a 2-channel input high fidelity commercial mono audio amplifier that will deliver 250 watts of *continuous* RMS power into a direct coupled 8-ohm voice coil load or into a constant voltage 25V or 70.7V line. Only 2 racks in height, the **D-250AL** uses a toroidal power transformer to reduce weight, height, and noise. The **D-250AL**, designed for commercial sound or "all-in-one" telephone paging applications, offers a balanced 600-ohm/tel-page input that is capable of muting the two high Impedance inputs that are strapped in parallel (thereby offering a convenient auxiliary input bridge to additional amplifiers). The 600-ohm/tel-page level is controlled via an independent tamper-resistant control.

Features

- 250 watts continuous RMS power
- 8 Ω , 25V or 70.7V outputs
- Independent input gain control for 600 ohm telephone paging
- Auxiliary RCA type inputs for receiving source signal and bridging source signal out
- Fully isolated output transformer for 25 and 70.7 volt line operation
- UL Approved
- Multiple protections including relay, short circuit and A/C circuit breaker
- Convection cooled, reliable "no maintenance" design
- Low-cut filter for horn protection
- Automatic voice activated Hi-Z muting
- Rack mount standard 2 RU

SPECIFICATIONS

Inputs	Auxiliary , 2 RCA Connectors in Parallel for Input and Bridging. High Impedance Unbalanced, 0.50V, 10k Ohm. Telephone Page , Screw Terminal, 50mV, 600 Ohm Balanced, with VOX Mute. Line Level , 600 Ohm Balanced Input, 0.50V
Power Output	250 Watts RMS Rated at 8 Ohm Direct, 25V, and 70.7V
Audio Output	4-8 Ohm, 25V, or 70.7V
Distortion at Rated Output	$\leq 0.3\%$ THD
Frequency Response	± 1 dB 20 to 20kHz (Direct Output); ± 1 dB 50Hz-15kHz on 25V, or 70.7V output
Hum/Noise	90dB Below Rated Output
Power Source	120VAC 60Hz
Dimensions	3.5" (H) x 19" (W) x 12" (D)
Weight	26 lbs.(11.8 kg)
Finish	Flat Black





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I. UNPACKING PROCEDURES

INSPECTION

This unit was carefully checked and packed before leaving the factory. However, each shipment should be inspected by observing the shipping container and unit for indications of improper handling. If damage has been found, an immediate claim should be made to the shipping company. Keep all cartons and packing material for inspection. **Do not call J. W. Davis & Company or return the shipment to J. W. Davis & Company until the shipment has been examined by the shipping company.** Failure to permit the shipping company to examine the shipment at the arrival point may void subsequent settlement. If there is a problem after the shipping company has made its inspection, then call Customer Service at J. W. Davis & Company for assistance.

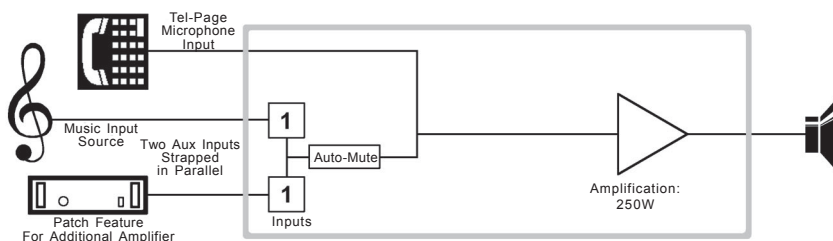
INITIAL PERFORMANCE CHECK

Complete the inspection with an initial performance check. Connect a test speaker to the 8-ohm direct output terminals. Then, connect a tuner, tape deck, or CD player to the auxiliary input and set the controls for operation. If the unit should be inoperable and no damage is noted, please contact J. W. Davis & Company's Customer Service Department for directions (800-527-5705).



CAUTION: TO PROTECT THE SPEAKER FROM DAMAGE, DO NOT TURN THE UNIT ON UNTIL ALL CONNECTIONS HAVE BEEN MADE. IN ADDITION, BE SURE THAT THE UNIT IS GROUNDED BEFORE TESTING.

II. PRODUCT OVERVIEW



D-250AL POWER AMPLIFIER

III. INSTALLATION INFORMATION

RACK MOUNTING

For best results use a 10-32 class UNF-2B or 12-24 class UNC-2B rack and 0.625 inch machine screws (metric: M5X8-6H or M6X1-6H, 15.88mm). It is recommended that the drive of these screws be phillips to protect the finish from unnecessary scratches. Nylon or plastic washers are recommended which will not only help protect the finish but also aid in retaining the screws.

CONVECTION, FAN COOLING, AND VENTILATION

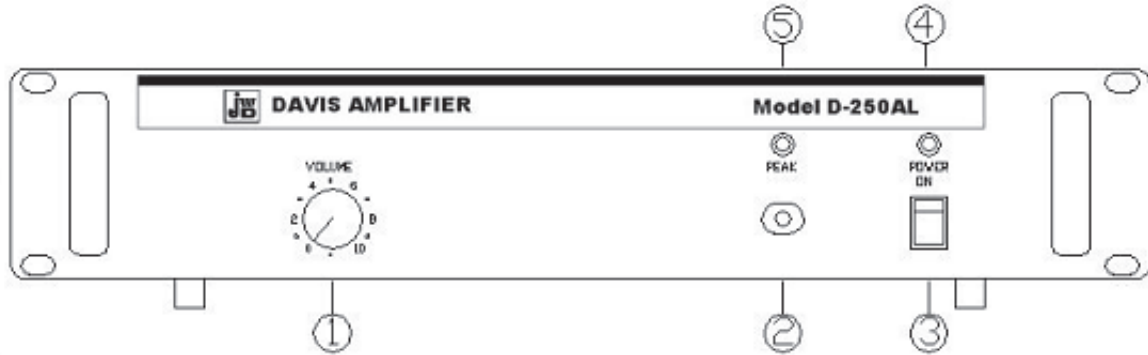
This unit is cooled via convection and therefore designed for continuous operation. Do not block the unit's heatsink fins or the vent holes located in the cover. If the unit will be rack mounted, a cooling fan must be used that is capable of exhausting not less than 300CFM. The fan must be mounted to the inside top of the rack, above the amplifier.





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IV. THE FRONT PANEL



1. Volume Control: Adjusts the amplifier's output level.

2. Circuit Breaker: If the amplifier is continuously overloaded, this AC line circuit breaker will trip. Another cause for the circuit breaker to trip is that the internal temperature surpasses the safe operating range. Pushing the plunger will reset the breaker. However, it is important to first correct the problem causing the overload or overheating. (Additional protection is provided by fuses in the power supply.)

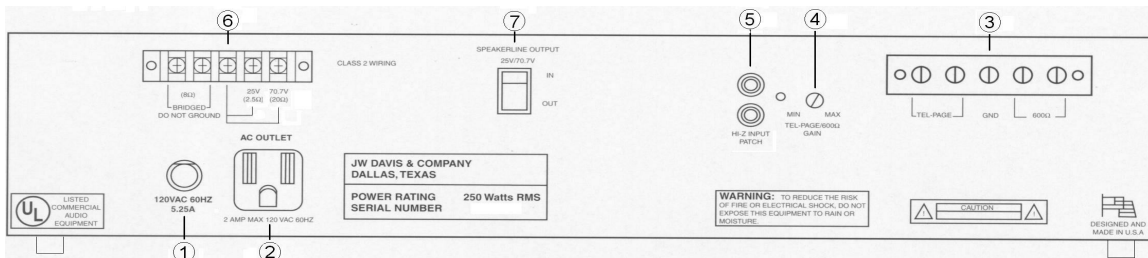
3 & 4. Power Switch and Indicator (ON - OFF): Controls power to the unit. The green LED will light when power is being received.

5. Peak Power Overload Indicator: LED will light/flash at full power and on peaks. A steady bright glow could indicate a shorted speaker line, too much load, or oscillation in the system.

Relay. A relay has been added to the D-250AL circuitry to prevent any DC from reaching the output. A slight delay of the audio will be noticed when the unit is turned on as well as an abrupt disconnect of the audio when the unit is turned off.

Overload protection. If a short circuit or overload occurs in the amplifier, or if the speaker line is overloaded or shorted, the AC line circuit breaker on the front panel will open. Correct the problem, then push the button to reset. If the circuit breaker will not reset, have the unit serviced by a qualified technician.

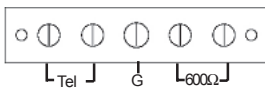
V. THE BACK PANEL



1. AC Line Cord: Three conductor line cord for AC voltage.

2. AC Convenience Outlet: Grounded outlet to run additional equipment (2 amp maximum).

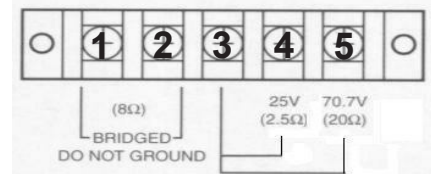
3. Input Terminal Screw Strip: This strip is designed to accept either a 600Ω balanced input or a tel-page balanced input. These inputs, differing only in sensitivity, are designed for wide acceptance without the need for any accessories.



4. Gain Control for 600Ω Tel-Page Input: This control adjusts the level of the 600Ω tel-page input without affecting the level of the high impedance input. It works in conjunction with the volume control located on the front panel. Both controls effect the 600Ω tel-page input, and will automatically mute the Hi-Z (music) inputs. To defeat VOX mute, see Section VIII, page 6.

5. Input/Patch: Two high impedance inputs connected in parallel for signal input and for strapping to a second amplifier that will increase the wattage of the entire system.

6. Output Terminal Strip: 8 OHM - Bridged output for an 8Ω direct voice coil speaker. Do not ground either terminal. 25V/70.7V - For constant voltage speaker lines using speakers with line matching transformers. Connect the speaker line to "common" and either 25V or 70.7V output.



7. 25V/70.7V Line Output Switch: Dual purpose switch connecting the output transformer in and out of circuit. It also controls a low-cut filter designed to prevent low frequency in and out of circuit. It is designed to prevent low frequency overload of speaker line transformers and horn type speakers. For either 25V or 70.7V operation, the switch must be set to the LINE IN position.





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VI. SPEAKER INSTALLATION

The **D-250AL** is designed to be connected to 8-ohm speakers directly, or to variable impedance speakers that match the amplifier's line output voltage of 25V or 70.7V speaker lines.

CONNECTING FOR DIRECT 8-OHM OPERATION

Connect 8-ohm speaker(s) to terminals 1 (-) and 2 (+). See page four. To maintain proper phasing, observe correct polarity. **NOTE:** This is a bridged output. Do not ground either of these two terminals.

CONNECTING FOR 25V or 70.7V LINE OPERATION

For 25V output, connect the load to terminals 3 (-) and 4 (+). For 70.7V output, connect the load to terminals 3 (-) and 5 (+). See page four.

NOTE: When using the amp's 25V or 70.7V line operation, the proper tap setting of the impedance matching transformer determines the individual speaker's power level. Using these transformers allows the speakers to be placed at longer distances from the amplifier without significant power loss. The number of speakers for a line-driven central amplifier system is limited to the power available from the amplifier. The sum of all connected speakers' power settings must not exceed 80% of the total power available from the amplifier.

USING THE PROPER WIRE SIZE AND LENGTH

Cable distance should be kept as short as possible to minimize power loss. The chart below can be used as a general guide showing various wire sizes and the maximum distance related to cable loading that speakers can be placed from the unit for an approximate -0.5dB loss (-12.5% power). To allow for future expansion and distributed cable line loss, it is recommended the total system wattage should not exceed 80% of the amplifier's rated output. To determine the total system wattage, sum the wattage tap of all speaker(s)/horn(s) used.

2-WIRE COPPER CABLE LENGTHS FOR SPEAKER LINES AT -0.5dB LOSS IN SPL (12.5% POWER LOSS IN WATTS)

AWG SIZE	LOW IMPEDANCE SPEAKER LINE			70.7V SPEAKER LINE (FOR 25V LINE DIVIDE ALL 70.7V LENGTHS BY 8) NOMINAL POWER IN LOAD								
	4 OHMS	8 OHMS	16	7.5W	15W	30W	60W	100W	125W	250W	400W	500W
10	120	240	480	-	-	5,000	2,500	1,500	1,100	550	365	275
12	75	150	300	-	6,200	3,100	1,550	940	750	375	230	185
14	50	95	190	7,600	3,800	1,900	950	600	450	225	140	110
16	30	60	120	4,800	2,400	1,200	600	370	290	145	90	-
18	20	40	75	3,000	1,500	750	375	230	180	90	-	-
20	15	25	50	1,920	960	480	240	150	110	-	-	-
22	10	15	30	1,200	600	300	150	95	-	-	-	-
WIRE LENGTHS IN FEET												

VII. USING HORN SPEAKERS

THE LOW-CUT FILTER

The **D-250AL** is equipped with a low cut filter that is activated by the LINE OUTPUT switch. When the switch is in the IN position the 25 and 70.7 volt outputs will roll-off any frequencies below 120Hz. Low frequencies can damage horn diaphragms, as well as compression drivers, if no filter is used. **NOTE:** Some installations may require additional electronic equipment to protect a total horn, or compression driver type installation.





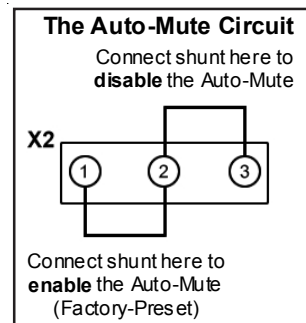
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VIII. THE AUTO-MUTE CIRCUIT

DISABLING THE AUTO-MUTE CIRCUIT

The JWD series of mixer amplifiers include a built-in automatic mute circuit. The MIC/tel-page 600-ohm input channel can automatically mute the AUX channel. This unit is factory installed to auto-mute; however, the mute is defeatable by moving the internal mute jumper to its other position.

To defeat the auto-mute circuit follow these steps. 1) Unplug the A/C cord. 2) Remove the hood and find the input board located on the back panel. 3) On the board locate the header X2 (See the figure to the right). Change the shunt position from positions 1 and 2 to 2 and 3 and the auto-mute will be defeated.



IX. MAINTENANCE

The **D-250AL** is built to last and therefore comes equipped with multiple built-in protections including relay, short circuit and AC circuit breaker. If the unit is overloaded (e.g., too many speakers, shorted speaker line, mismatched line impedance [e.g., 8-ohm speaker on 70.7V line]) or overheated (e.g., obstructed or poor ventilation of the unit, mismatched line impedance) the unit will fail to provide output. Overloading and overheating of the amp can lead to premature output failure.

RESETTING THE AC CIRCUIT BREAKER

If a the unit is overloaded or it overheats, the AC line circuit breaker on the front panel will open. Before resetting the circuit, determine and correct the problem causing the overload or overheating (see "Troubleshooting" on page 8 for a chart to help guide you in determining the cause of the problem). If after exhausting the possibilities the circuit breaker will not reset, have the unit serviced by a qualified technician.

NOTE: If the unit is rack mounted, you must utilize a cooling fan that is capable of exhausting not less than 300CFM.

REPLACING THE FUSES

Additional protection is provided by fuses in the power supply which protect the transformer. If an output is shorted, the fuses will blow. Before replacing the fuses, determine and correct the problem causing the fuses to blow (see "Part X. Troubleshooting" on page 8 for a chart to help guide you in determining the cause of the problem). To safely replace the fuses: 1) Disconnect the AC power cord; 2) Remove the top cover screws and cover; 3) Replace blown fuses with **the same type and size**; 4) Reinstall the top cover securely; 5) Reconnect the AC power cord.

X. WARRANTY & TECHNICAL SUPPORT

For a period of five (5) years from the date of original purchase, J. W. Davis & Company warrants that it will correct any defects in material or workmanship in the **D-250AL** without charge. However, this warranty does not apply to equipment which in the opinion of J. W. Davis & Company has been subjected to abuse or accident, improper installation or alteration in any way. If the **D-250AL** fails to operate during this period, return it **prepaid** to J. W. Davis & Company Warranty Service with a letter explaining the problem and proof of purchase.

Should you require further technical support, please contact our Customer Service Department for assistance through any of the channels shown below.

-6-

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XI. TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTIONS
Power Indicator on Front Panel Does Not Glow:	No AC power present	• Verify the unit is receiving AC power. • Verify the AC outlet has proper AC voltage available.
	Unit's AC circuit breaker is tripped	• Verify the AC circuit breaker is not tripped. If so, depress the plunger to reset. • Verify the unit's internal fuse(s) has not tripped. If it has, replace the tripped fuse with the same type and value fuse.
Overload Indicator on Front Panel Glows Steadily:	Input or output impedance not matched	• Check that the proper input/output line impedance matches the selected input/output connections used.
	Signal in level too high	• Lower the signal in level.
No Audio Output:	No input signal source	• Verify that proper signal/level is being supplied.
	Incorrect input signal connection	• Verify that the signal input connection is correctly connected.
	Incorrect output connections	• Check that the output connection has been properly made.
	600-ohm/tel-page gain control on back panel too low	• Check 600-ohm/tel-page gain control setting (recessed on back).
No Automatic Muting of Input Signal:	Internal jumper setting	• Check that the internal mute jumper is not disabled. (See page 7.)
	Insufficient 600-ohm/tel-page gain	• Check 600-ohm/tel-page gain control setting (recessed on back).
Low, High, or Distorted Level:	Volume setting	• Check the corresponding gain control on the front panel or the 600-ohm/tel-page control (recessed on the back).
	Signal input level is too low	• Check that adequate input signal level is strong enough.
	Signal input level is too high	• Reduce input signal accordingly.
	Input or output impedance not matched	• Check that the proper input/output line impedance matches the selected input/output connections used.
	Possible low resistance or shorted wiring across the audio in and/or across the speaker out	• Check and correct system wiring.

XII. OPTIONAL ACCESSORIES

- Optional 600-ohm Isolation Transformer (IT-600)
- Speaker Lightning Suppressor (SLS)
- Tel-Page Line-lightning Suppressor (TLS)
- Universal ADD-ON-AMP (AO-1A) used to match 4 or 8-ohm, 25V and 70V speaker line to MIC or Auxiliary input of amplifier
- Signal Matching Attenuator (AT-20A), Matches Signal from Tuner or Other high Z Device to Amplifier MIC Input
- Signal Matching Attenuator (AT-20B), Matches Signal from Telephone Line or Other Low Z Device to Amplifier MIC Input
- Signal Matching Attenuator (AT-20C), Matches Signal from 70V Speaker Line Output to AUX Input of Second Amplifier

